

The harvestman fauna of Hungary (Arachnida, Opiliones)

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Abstract

In addition to few and partly questionable unpublished historical data from the collection of the natural history museum of Vienna, faunistic data for 27 harvestman species from 32 Hungarian localities spread over the whole country are provided. *Trogulus tingiformis* is definitively occurring in Hungary, *T. nepaeformis* is recorded for the first time and *Holoscotolemon jaqueti* is documented from the Bükk Mountains. An up-to-date checklist of definitively known taxa contains 33 species belonging to 6 families.

Key words: harvestman, checklist, *Holoscotolemon jaqueti*, *Trogulus tingiformis*, *T. nepaeformis*

INTRODUCTION

Hungarian arachnologists paid little attention to the order Opiliones with the exception of Dr. Gábor Kolosváry. The research on the harvestman-fauna of Hungary began at the end of the 19th century; in 1929 Kolosváry's comprehensive book "Magyarország Kaszáspókjai / Die Weberknechte Ungarns" came out. Although dozens of opilionological papers have been published, a lot of fundamental problems remain unsolved. Only 33 harvestman species are actually known from Hungary, while the species-numbers of the adjacent countries are 33 (Czech Republic and Slovakia respectively: Klimes 2000), 42 (Ukraine: Klimes 2000.), 46 (Romania: Martens 1978; Weiss 1996), 63 (Croatia: provisional number, estimated at least 80 spp. T. Novak in litt.), 63 (Slovenia: Novak & Gruber 2000) and 61 (Austria: Komposch 2002). Thus an urgent need for action is obvious. The aim of the present paper is to give a short survey of the history of exploration, an up-to-date checklist, and further new datasets from various parts of the country collected between 1996 and 2003, including ecological details.

SHORT HISTORY OF EXPLORATION

The oldest harvestman-datasets from Hungary concern the phalangids *Phalangium opilio*, *Opilio parietinus* and *O. saxatilis* collected by R. Anker in the years 1872 (?), 1880 and 1881 (Coll. NHMW).

In 1879 Ottó Herman published "Magyarország Pók-Faunája / Ungarns Spinnen-Fauna", the first comprehensive work which listed 26 harvestman species for "Hungary" (taking into account the changing political situation with the historic borders of the Austrian-Hungarian monarchy with Transylvania, Slawonia, Croatia and Slovakia under the Hungarian crown) in the appendix of his book, while table X depicts *Paranemastoma sillii*, which has been described by this author sub *Nemastoma Sillii* from Hermannstadt (= Sibiu) eight years before.

Herman's fauna was followed by Adolf Lendl's (1894) "Opiliones Musaei nationalis Hungarici" (47 spp.) and Eugenius Daday's (1896) "Fauna Regni Hungariae/ Ordo. Opiliones" (58 spp.). Carl-Friedrich Roewer (1923) mentioned Hungary several times in his voluminous work "Die Weberknechte der Erde".



Fig. 1. Prof. Dr. Gábor Kolosváry (Gabriel von Kolosváry) (1901-1968), the great Hungarian opilionologist.

Gábor Kolosváry (Fig. 1) produced the finest research on harvestmen in Hungary. Publishing "Magyarország Kaszáspókjai / Die Weberknechte Ungarns" (54 spp.) his main intent was to make a comprehensive and monographical "Hungarian Roewer book" (1929: 7). Unfortunately Kolosváry did not trust his own careful drawings (of genital characters, etc.) but rather followed the obscure systematics of Roewer; because of this, the systematic part is not very useful in contrast to his morphological, anatomical and biological investigations on harvestmen. Several papers between 1932 and 1969 dealt with faunistic, taxonomic and ecological topics.

The most important arachnologist of the second half of the 20th century, Imre Loksa, did not forget the harvestmen beside his intensive work on spiders (1948-1991). László Szalay investigated the Opilionids, described *Nelima sempronii* (1951) and other synonyms from the region of Sopron and summarised his results in the "Fauna Hungariae – Arachnoidea I., 4. Phalangidea" (1968). The recent authors Jochen Martens and Jürgen Gruber (e. g. 1978 with 27 spp. mentioned from Hungary) tidied up Roewer's chaos, at least in Central Europe. Ruud van der Weele (1998a)

used his short scientific stay at the museum in Budapest to publish the first record of Laniatores from Hungary and a checklist of the Opiliones unequivocally known from the country (28 spp.).

Further opilionological data were provided by Anton v. Gebhardt, Endre Dudich, Vilmos Székessy, L. Havranek & H. Molnár, Miklós Hörömpöly and Stefania Avram. Recent faunistic and ecological work has been done by András Varga, Zsuzsanna Bokor, Dávid Murányi and Tamás Szűts, respectively.

MATERIAL AND METHODS

Series of the Opiliones collection from the Naturhistorisches Museum Wien (NHMW) with Hungarian provenance were revised by Jürgen Gruber. Concerning the recent data, harvestmen were collected by means of a soil-sifter (s.-s.) and hand-collecting (h.-c.) in May 1996 (field trip organised by the Institute of Zoology from the University of Graz; Ch. & B. Komposch (K.) leg.), from July to September 2002 (Ch. & B. Komposch, M. & T. Frieß leg.) and in June 2003 (G. Kunz leg.) in the localities H-1 to H-32 (Fig. 2). For the list of collecting places see Appendix I. The material is deposited in the private collection of the author.

Historical data from the collection of the NHMW

A few series of Hungarian harvestmen (*Phalangium opilio*, *Opilio parietinus*, *O. saxatilis* and *Zacheus crista*) collected between 1872 and 1905 are deposited in the Naturhistorisches Museum Wien (NHMW). A single series of *Astrobus laevipes* from the Tisza plain was provided by St. Avram. (m = male, f = female)

Ofen/ 1. Stuhlweissenburg, 2. Szerard (?) (remark: origin doubtful), 1872 (rem: year of acquisition?), R. Anker leg., C.-F. Roewer det.

- *Phalangium opilio* Linnaeus 1 f (NHMW 3802)

Ofen (rem: an old German name of Buda, the western part of Budapest), 1880, R. Anker leg., C. Koelbel det.

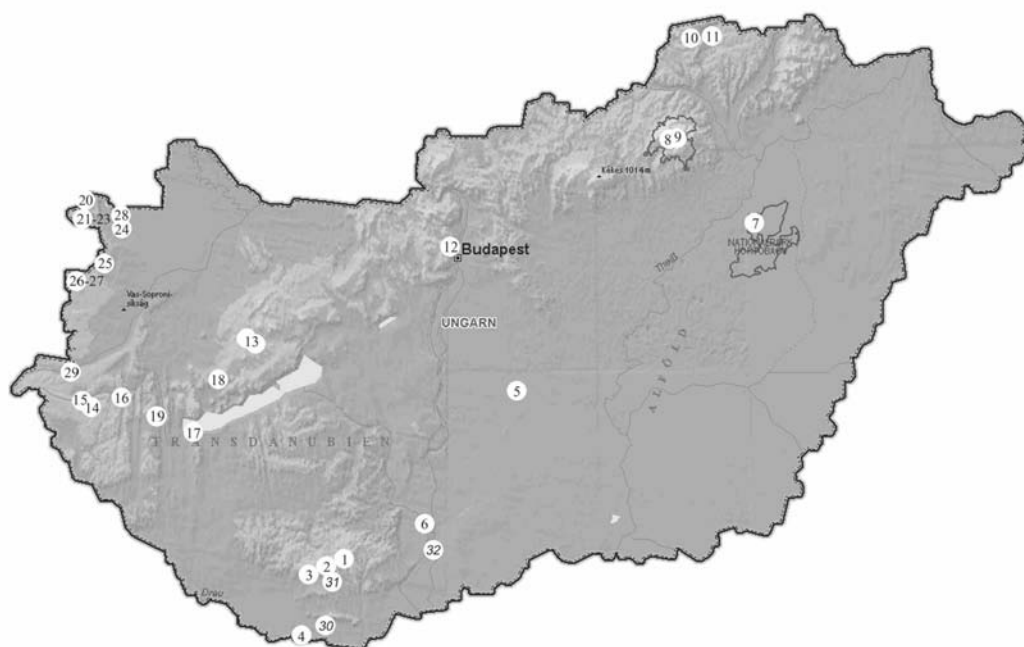


Fig. 2. Map of the collecting points H-I to H-32 (1996-2003). The list of collecting places is given in Appendix I.

- *Opilio parietinus* (De Geer) 6 m, 9 f (NHMW 3914)

- *Opilio saxatilis* C. L. Koch 2 f (NHMW 3928), J. Gruber rev.

Gödöllő (rem: NE Budapest), 1880, ? leg., Steindachner don., C. Koelbel det.

- *Opilio parietinus* (De Geer) 5 m, 4 f, 1 Juv. (NHMW 3915)
- *Opilio saxatilis* C. L. Koch 1 m, 5 f (NHMW 3929), J. Gruber rev.

Velenteze bei Stuhlweissenburg (rem: Velence, near Székesfehérvár), 1881, R. Anker leg., Steindachner don., C. Koelbel det.

- *Opilio parietinus* (De Geer) 4 m, 4 f, (NHMW 3916)
- *Opilio saxatilis* C. L. Koch 2 f (NHMW 3930), J. Gruber rev.

Visegrád (rem: N Budapest), 1905, Penther leg., C.-F. Roewer det.

- *Zacheus crista* (Brulle) 2 Ind.; sub *Z. hungaricus* Lendl

Tisa (rem: = Tisza) km 744, 21.07.1967, St. Avram leg. et don.

- *Astrobus laevipes* (Canestrini) 1 m, 1 f (NHMW 3450); sub *A. meadi*

A further dubious record from “Ungarn” concerns a series of *Leiobunum limbatum* L. Koch (10 m, 3 f; NHMW 3556), together with *Leiobunum roseum* (6 m; NHMW 3554) and *Leiobunum rupestre* (1 m; NHMW 3557) collected by Frauenfeld and determined by Roewer.

RESULTS

Faunistic research

The author's investigations from 1996 to 2003 led to a total of 148 data sets (398 specimens) belonging to 27 species and 6 families; 382 specimens have been determined to species (Appendix II). Nearly 82% of the known Hungarian species spectrum could be collected during two weeks.

Checklist

33 harvestman-species belonging to 6 families are definitively known from Hungary

(Appendix III). The possible occurrence of *Paranemastoma silli*, *Gyas titanus* and *Platybunus pallidus* should be confirmed by further observations. A mysterious record of *Anelasmoecephalus cambridgei* (Westwood, 1874) from the Bükk Mountains was published by Loksa (1968: 277, sub "*Anelasmoecephalus cambridgei* Westw." and without further comments); it is the one and only reference to the presence of a representative of this genus in Hungary. If we assume a correct determination of the genus, the species is likely to be *Anelasmoecephalus hadzii* Martens, 1978. Chemini (1984) was the first to show a wider distribution of *Trogulus closanicus* Avram, 1971 in Central Europe; an occurrence in Hungary is likely and further material (especially from pitfall traps e.g. from araneological and carabidological investigations) should be studied. The Carpathian taxa (Martens 1978; Weiss 1996) *Ischyropsalis manicata* L. Koch, 1865 and *Siro carpaticus* Rafalski, 1956 could be expected in northern Hungary.

The specific search for the – in some parts of Central Europe synanthropic – taxa *Opilio canestrinii* (Thorell) and *O. ruzickai* Silhavy in several promising anthropogenic habitats was fruitless, although Gruber (1996, 2000) is aware of localities close to the Hungarian border (e.g. Eisenstadt). In Slovenia *O. ruzickai* can be found along rivers frequently (T. Novak in litt.), synanthropic records are rather rare; a similar ecological behaviour of this species in Hungary seems possible.

Remarkable taxa and new records to Hungary

Holoscotolemon jaqueti

H. jaqueti (Fig. 3) shows a disjunct distribution and occurs in the Carpathians (Ukraine, Romania) and southern Yugoslavia (Bosnia, Montenegro and Serbia (Curcic et al. 1999)); "Nachweise aus der CSSR/Slowakei und aus Ungarn stehen aus; sie sind aber zu erwarten, da jeweils grenznahe Funde bekannt sind" (Martens 1978: 81). Imre Loksa (e.g. 1966, 1979) did not find the species despite investigating the soil fauna of the Bükk Moun-

tains from 1954 to 1974. Ruud van der Weele (1998a) found one specimen at the beginning of October 1995 under a large stone, which lay deep in a thick layer of fallen leaves, in a beech forest in the Mátra Mountains near Mátraháza. In 1996 five specimens in total (2 males, 3 females) were collected by the author in thick layers of fallen leaves in moist beech forests at two localities in the Carpathian region (H-8, H-9; Fig. 4) by hand-collecting and using the soil-sifter respectively.

The occurrence of this laniatore shows a zoogeographical relationship between the Mátra and the Bükk Mountains to the Carpathians, although Kolosváry (1935) considers the Mátra mountains – with regard to the spider-coenosis – as a part of the Pannonic basin and not of the Carpathians.



Fig. 3. The laniatore *Holoscotolemon jaqueti* from the Bükk Mountains (H-8/9).



Fig. 4. Habitat of *Holoscotolemon jaqueti*, moist beech forests in the Bükk Mountains near Répáshuta (H-8/9).

Trogulus cf. nepaeformis

Considering the map drawn by Martens (1978: 171), the occurrence of *Trogulus nepaeformis* – regardless of the question “What is *T. nepaeformis* (Scopoli, 1763)?” – had been expected in Hungary. (At least since S. Avram, I. Weiss, C. Chemini and U. Neuffer, opilionologists became aware of the problems in the *nepaeformis*-group; from the south-eastern Alps and Slovenia several “hidden” taxa are known (T. Novak in litt.)). Concerning the described taxa, the specimens collected in the Bükk Mountains (H-8), the Aggtelek National Park (H-10) and near Zalacsány (H-19) have to be provisionally identified as *Trogulus nepaeformis* s. str.

Kontschán et al. (2002) mentioned the species from the Vértes Mountains, further material comes from the Bakony Mountains: 1 f: Borostyán-kút, Bakonybél, 19.09.2001, beech forest in the surroundings of a cold spring lake, J. Kontschán & D. Murányi leg.; 1 f: Hajmás-patak, Réde, near the road between Réde and Bakonyszentkirály, 15.7.2001, under *Robinia* trees on the shore of a stream, J. Kontschán & D. Murányi leg.; 1 m: Gaja-patak, Bakonyháza, at the road to Tés, 26.06.2001, alder and willow-covered narrow and deep valley, pitfall-traps, J. Kontschán & D. Murányi leg.

Trogulus tingiformis

The distribution of this large trogulid (Fig. 5) reaches from western Hungary up to the Bakony Mountains from the Eastern Alps; its presence in the Carpathian region of Hungary is likely. Martens (1978: 173) already presumed “Das Karpaten-Areal ist wahrscheinlich (viel) ausgedehnter als bisher bekannt”. In the south-eastern Alps *Trogulus tingiformis* seems to occur mainly in the upper montane zone and reaches more than 2000 m (Komposch 1999). A ruderalized forest edge with numerous fallen tree trunks at 180 m height (H-14; Fig. 6) seems to be a typical habitat in western Hungary.

Two females of this species have been provided by Dávid Murányi: 26.09.2001, Bakony Mountains, Gaja, Balinka, lower section of the Gaja-stream, small willow wood close to the stream, J. Kontschán leg.

CONCLUSIONS AND OUTLOOK

The actual known number of harvestman species is 33, but about 40 taxa can be expected from Hungary. Consequently, increased atten-



Fig. 5. The largest trogulid of Central Europe, *Trogulus tingiformis*, belongs definitively to the fauna of Hungary; the picture shows a female from the locality H-14 (E Kávás).



Fig. 6. Habitat of *Trogulus tingiformis*, diverse forest edge with fallen tree trunks E Kávás and WNW Zalaegerszeg (H-14).

tion should be paid to the zoogeographically interesting Hungarian harvestman fauna with its Alpine, Carpathian and Pannonical faunal elements. Faunistic investigations – the study of remaining material from pitfall-traps has already been suggested by Van der Weele (1998b) – would be worthwhile. Special interest should be taken to petrophilous and arboricolous taxa, and the synanthropic fauna and the Carpathian region, respectively. The questionable presence of the genus *Anelasma-cephalus* in Hungary should be verified by means of a soil-sifter. Unsolved taxonomic problems remain concerning the genera *Leiobunum* and *Trogulus* (What is *Trogulus aquaticus* Simon?).

Furthermore, harvestmen show quite good characters which can be used as habitat descriptors and bioindicators; they are useful instruments for modern work in nature conservation and landscape planning. Although the European Community does not regard any harvestman as a species of Community interest (Council Directive 92/43/EEC), Opilionids have been proposed as monitoring-organisms for describing and evaluating the conservation status of the natural habitat types of Community interest (Annex I) (Landesamt für Umweltschutz Sachsen-Anhalt 2002).

A rewarding goal would be the accumulation of all available – and reliable – data sets in a modern database, the production of a Hungarian catalogue of Opiliones including distribution maps as a useful basis for a red data list of threatened harvestmen in Hungary.

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Appendix I. List of collecting localities.

H-1: 20.05.1996: 2 km NW Hosszúhetény (near the Kövestető Hotel), NE Pécs, Mecsek Mountains SE, 46°09' N, 18°20' E, 420 m; dry oak and oak-hornbeam wood, h.-c., Ch. K. leg.

H-2: 21.05.1996: Misina (limestone-hill above the Dömörkapu car park), Pécs N, Mecsek Mountains S, 46°06' N, 18°14' E, 360-440 m; downy oak and beech forest respectively, h.-c., s.-s., Ch. & B. K. leg.

H-3: 21.05.1996: Duliman-dűlő, 1 km S Cserkút, W Pécs, Mecsek Mountains S, Transdanubia, 46°04' N, 18°07' E, 180-220 m; downy oak forest with shallow layer of soil, h.-c., Ch. & B. K. leg.

H-4: 22.05.1996: Dráva-meder (flood-plain wood), S Kémes, left river bank, SW Harkány, SSW Pécs, 45°46' N, 18°05' E, 100 m; silted-up zone of a pond with *Phragmites*; under a root-stock, h.-c., Ch. & B. K. leg.

H-5: 23.05.1996: Kiskunság National Park, 2-3 km W Fülöpháza, W Kecskemét, Tisza-lowland plain, 46°52' N, 19°24' E, 130 m; pusztas with a robinia-forest, h.-c., Ch. & B. K. leg.

H-6: 25.05.1996: Danube flood-plains, Bárányfok E Szekszárd, Gemenci-erdő Nature Reserve; right river bank near a narrow-gauge railway station, SW Sió/Danube-mouth, 46°18' N, 18°54' E, 100 m; moist litter of a poplar and oak wood, h.-c., s.-s., Ch. & B. K. leg.

H-7: 27.05.1996: Hortobágy National Park,

NW Ohati erdő, Feskeret, Nyírólapos, Nyári-Járás; Tisza-lowland plain, ? N, ? E, 100 m; litter of a Turkey oak forest and *Phragmites*, h.-c., s.-s., Ch. & B. K. leg.

H-8: 28.05.1996: Bükk Mountains, 3 km W Répáshuta near the Heregrét car park, W Miskolc, Fekete-lén, 48°03' N, 20°30' E, 600-650 m; moist, calciphilous beech forest with deep leaf litter accumulations in a doline, s.-s., Ch. & B. K. leg.

H-9: 28.05.1996: Bükk mountains, Répáshuta, SW-slope of Köves-Várad, Balla-bérc NE-slope, 48°02' N, 20°31' E, 450-500 m; moist, calciphilous beech-maple forest with shallow leaf layers and moss-covered rocks, h.-c., s.-s., Ch. & B. K. leg.

H-10: 29.05.1996: Aggtelek National Park, Szelcepuszta N Miskolc, brook Ménes-patak, 7 km NE Jósvalfő, N Szinpetri, 48°31' N, 20°36' E, 350-470 m; moist, calciphilous beech-maple forest with deep leaf litter accumulations near a brook, h.-c., s.-s., Ch. & B. K. leg.

H-11: 29.05.1996: Aggtelek National Park, 1 km N Komjáti above Pasnyag-f., 3 km NE Bódvaszilas, N Miskolc, 48°33' N, 20°45' E, 180 m; meadowssweet fen and *Phragmites-Urtica*-stock near a brook, h.-c., Ch. & B. K. leg.

H-12: 30.05.1996: Budapest NW, quarry Mátyás hegy, right river side of the Danube, 47°34' N, 19°01' E, 230 m; dry oak-pine forest and ruderal area with *Crataegus* and *Rosa*, h.-c., Ch. & B. K. leg.

H-13: 31.05.1996: Bakony-wood, SE Kislőd, S little railway-station, SW Városlőd, W Veszprém, 47°09' N, 17°37' E, 300 m; beech forest near a brook, s.-s., Ch. & B. K. leg.

H-13': 31.05.1996: Bakony-wood, SE Kislőd, near a little railway-station, SW Városlőd, W Veszprém, 47°09' N, 17°37' E, 300 m; meadows sweet fen like moist meadow with *Phragmites*, h.-c., Ch. & B. K. leg.

H-14: 11.07.2002: E Kávás, above road, WNW Zalaegerszeg, Transdanubia, 46°52' N, 16°43' E, 180 m; ruderal area and forest edge with numerous fallen tree trunks and dry-stone piles, h.-c., Ch. & B. K., T. & M. Frieß leg.

- H-15:** 11.07.2002: N Kávás, right river bank near a bridge, W Zalaegerszeg, Transdanubia, 46°52' N, 16°42' E, 170 m; silted-up river zone and concrete wall of the bridge respectively, h.-c., Ch. K. leg.
- H-16:** 11.07.2002: Zalaegerszeg, W centre near a church, Transdanubia, 46°50' N, 16°50' E, 170 m; concrete wall of a building, h.-c., Ch. & B. K., T. Frieß leg.
- H-17:** 11.07.2002: Balaton W, W Balatonberény, SE Keszthely, 46°42' N, 17°18' E, 170 m; old willow wood with a +/- moist leaf litter, s.-s., Ch. K. & T. Frieß leg.
- H-18:** 12.07.2002: Haláp, basalt mountain-summit, N Zalahaláp, NNE Tapolca, 46°55' N, 17°27' E, 280 m; robinia-forest with small screes; under stones, h.-c., Ch. K. & T. Frieß leg.
- H-19:** 12.07.2002: W Zalacsány, W Keszthely, Transdanubia, 46°48' N, 17°04' E, 175 m; alder (poplar) forest with a shallow and moderate moist leaf layer, s.-s., Ch. & B. K., T. & M. Frieß leg.
- H-20:** 08.08.2002: SE Draßburg, near Austrian border, NW Sopron, E Mattersburg, 47°42' N, 16°33' E, 260 m; small field shrub with walnut trees, elder and bramble thicket, h.-c., Ch. K. leg.
- H-20':** 08.08.2002: SE Draßburg, near Austrian border, NW Sopron, E Mattersburg, 47°42' N, 16°33' E, 260 m; thin litter in a small moist furrow in a small field shrub with walnut trees, elder, bramble and *Urtica*, s.-s., Ch. & B. K. leg.
- H-21:** 09.08.2002: Brennbergbánya, near the graveyard "Zur heiligen Barbara", WSW Sopron; Ödenburger mountains, 47°39' N, 16°30' E, 460 m; ruderal hornbeam-spruce-forest edge; under lying spruce trunks, h.-c., Ch. & B. K. leg.
- H-22:** 09.08.2002: Brennbergbánya, NE the graveyard "Zur heiligen Barbara", WSW Sopron; Ödenburger mountains, 47°39' N, 16°30' E, 460 m; fresh deciduous forest with alder, hazel, linden, hornbeam and bramble, s.-s., Ch. & B. K. leg.
- H-23:** 09.08.2002, Brennbergbánya, mining gallery, Ort; WSW Sopron, 47°39' N, 16°29' E, 435 m; mining gallery, entrance area up to 15 m into the mountain, h.-c., Ch. K. leg.
- H-24:** 09.08.2002: Hegykö, church; WNW Kapuvár, Neusiedler lake, 47°37' N, 18°47' E, 125 m; concrete wall of a building, h.-c., Ch. & B. K. leg.
- H-25:** 10.08.2002, Répcévis (Heils), river Répce (Rabnitz), ENE Kőszeg (Güns), 47°26' N, 16°40' E, 175 m; concrete wall of a bridge, h.-c., Ch. & B. K. leg.
- H-26:** 10.08.2002: Geschriebenstein Nature Park, near car park, NNE Óház, WSW Kőszeg (Güns), 47°23' N, 16°30' E, 495 m; chestnut-(oak)-forest with deep leaf litter accumulations in a furrow, s.-s., Ch. & B. K. leg.
- H-27:** 10.08.2002: Geschriebenstein Nature Park, beside road to Velem (St. Veit), NNE Óház, WSW Kőszeg (Güns), 47°22' N, 16°30' E, 400 m; scree in a fresh deciduous forest with maple, linden, hornbeam and beech, h.-c., Ch. & B. K. leg.
- H-28:** 10.08.2002: Fertő-Hanság National Park, Neusiedler lake S-shore, N Hegykő, WNW Kapuvár, 47°38' N, 16°47' E, 125 m; willow wood edge near agricultural area and reed bed, h.-c., Ch. K. leg.
- H-29:** 09.09.2002: River Rába (Raab), right river side, NW Háromház (Dreihof), ENE Szentgotthárd (St. Gotthard), SE Heiligenkreuz, 46°57' N, 16°19' E, 205 m; ruderal river banks with an old willow; under boards, h.-c., Ch. K. leg.
- H-30:** 17.06.2003: WSW Harkány, WSW Siklós, S Pécs; 45°50'N, 18°11'E, ~ 100 m; meadow; G. Kunz leg.
- H-31:** 18.06.2003: Pécs NW, Dömörkapu, surroundings of the Hotel Mediterran; 46°05'N, 18°12'E, ~ 350 m; oak-forest; G. Kunz leg.
- H-32:** 18.06.2003: Danube flood-plains W Baja, Gemenci-woods; 46°11', 18°52'E, 100 m; poplar wood; G. Kunz. leg.

Appendix II. Number of harvestman-specimens for each species at the particular localities H-1 to H-32.

no	Species	H-1	H-2	H-3	H-4	H-5	H-6	H-7	H-8	H-9	H-10	H-11	H-12	H-13	H-13'	H-14	H-15	H-16	H-17
1	<i>Holoscotolemon jaqueti</i>								3	2									
2	<i>Carinostoma elegans</i>											6							
3	<i>Mitostoma chrysomelas</i>						1		5	3	1				7				
4	<i>Nemastoma bidentatum</i> <i>sparsum</i>				1		2									1			6
5	<i>Nemastoma lugubre</i>									7	3								
6	<i>Paranemastoma quadripunct.</i>																		
7	<i>Dicranolasma scabrum</i>								6	3	5								
8	<i>Trogulus cf. nepaeformis</i>								2		2								
9	<i>Trogulus tingiformis</i>														1	2			
10	<i>Trogulus tricarinatus</i>									1									
	<i>Trogulus sp.</i>		1						2	2					2				
11	<i>Ischyropsalis hellw. hellwigi</i>																		
12	<i>Astrobus laevipes</i>															4			1
13	<i>Egaenus convexus</i>		2							7									
14	<i>Lacinius dentiger</i>		1	1															
15	<i>Lacinius ephippiatus</i>	1	1							3	2			6		3			
16	<i>Lacinius horridus</i>								1				2			7			
	<i>Lacinius sp.</i>						1												
17	<i>Leiobunum rotundum</i>																4		
18	<i>Leiobunum rupestre</i>																		
19	<i>Lophopilio palpinalis</i>		2				1												
20	<i>Mitopus morio</i>																		
21	<i>Nelima semproni</i>															15	4		
22	<i>Oligolophus tridens</i>																		7
23	<i>Opilio saxatilis</i>					6												1	
	<i>Opilio sp.</i>												4						
24	<i>Phalangium opilio</i>															8	4	1	
25	<i>Platybunus bucephalus</i>								3	8	3								
26	<i>Rilaena triangularis</i>	2	2				9				1								
27	<i>Zacheus crista</i>							2					1	1					
	total	3	9	1	1	6	14	2	22	36	17	6	7	7	10	40	12	2	14

no	Species	H-18	H-19	H-20	H-20'	H-21	H-22	H-23	H-24	H-25	H-26	H-27	H-28	H-29	H-30	H-31	H-32	total
1	<i>Holoscotolemon jaqueti</i>																	5
2	<i>Carinostoma elegans</i>																	6
3	<i>Mitostoma chrysomelas</i>		1			3												21
4	<i>Nemastoma bidentatum</i> <i>sparsum</i>		26			2	9				4							51
5	<i>Nemastoma lugubre</i>																	10
6	<i>Paranemastoma quadripunct.</i>					4		2										6
7	<i>Dicranolasma scabrum</i>																	14
8	<i>Trogulus cf. nepaeformis</i>		1															5
9	<i>Trogulus tingiformis</i>																	3
10	<i>Trogulus tricarinatus</i>																	1
	<i>Trogulus sp.</i>		2				1				1							11
11	<i>Ischyropsalis hellw. hellwigi</i>							3										3
12	<i>Astrobunus laevipes</i>				5													10
13	<i>Egaenus convexus</i>																	9
14	<i>Lacinius dentiger</i>					3												5
15	<i>Lacinius ephippiatus</i>																	16
16	<i>Lacinius horridus</i>			2		9												21
	<i>Lacinius sp.</i>																	1
17	<i>Leiobunum rotundum</i>									9				1				14
18	<i>Leiobunum rupestre</i>											10						10
19	<i>Lophopilio palpinalis</i>																	3
20	<i>Mitopus morio</i>											1						1
21	<i>Nelima semproni</i>	1	3	13	1	45		1				2	2	2			1	90
22	<i>Oligolophus tridens</i>		2	1		2	4											16
23	<i>Opilio saxatilis</i>													1				8
	<i>Opilio sp.</i>																	4
24	<i>Phalangium opilio</i>			1					5						1			20
25	<i>Platybunus bucephalus</i>																	14
26	<i>Rilaena triangularis</i>																1	15
27	<i>Zacheus crista</i>															1		5
	total	1	35	17	6	68	14	6	5	9	5	13	2	4	1	1	2	398

Appendix III. Annotated checklist of Hungarian Opiliones (status: x = definitively known from Hungary; ? = occurrence plausible; new = new to the fauna of Hungary; m/f/juv/ind = males/females/ juveniles/individuals = number of specimens collected between 1996 and 2003 at the localities H-1 to H-32, see Fig. 2). Systematic order of families after Martens (1978).

no.	family/species	status	m/f/juv/ind	comment
Cladonychiidae				
1	<i>Holoscotolemon jaqueti</i> (Corti, 1905)	x	2/3/-/5	first record by Van der Weele (1998a)
Nemastomatidae				
2	<i>Carinostoma elegans</i> (Soerensen, 1894)	x	-/6/-/6	locally distributed; one recent record in the Aggtelek National Park
3	<i>Mitostoma chrysomelas</i> (Hermann, 1804)	x	12/9/-/21	classified by Dudich (1932: 58) as a "Hemiotroglobiont", by Kolosváry & Homonnay (1967: 79) as a "montane Grottenbewohnerin"; several recent records in moist habitats; synonyms, <i>Crosbycus bükkensis</i> Loksa, 1962, <i>C. transdanubicus</i> Loksa, 1962
4	<i>Nemastoma bidentatum sparsum</i> Gruber & Martens, 1968	x	21/28/2/51	widespread in Hungary (e.g. Loksa 1962 sub <i>Nemastoma bidentatum</i> Roewer); the most efficient collecting-method is sifting the leaf-layer
5	<i>Nemastoma lugubre</i> (Müller, 1776)	x	5/5/-/10	lives in northern Hungary and Transylvania/Siebenbürgen (Weiss 1996); published partly sub <i>N. bimaculatum</i> (Fabricius) (e.g. Bokor 1998); see distribution map in Martens (1978: 105)
6	<i>Paranemastoma quadripunctatum</i> (Perty, 1833)	x	3/3/-/6	central European area; reaches the western parts of Hungary (Ödenburger mountains, Bakony Mountains?)
7	<i>Paranemastoma silli</i> (Herman, 1871)	?		endemic to the Carpathians; „Ungarn, Angaben im Schrifttum durchweg unsicher, da mehrere Arten (<i>silli</i> , <i>kochi</i> , <i>quadripunctatum</i>) ständig verwechselt wurden; hier erfolgt Zuordnung nach geographischer Evidenz, Tiszakarád (Kolosváry 1965, <i>N. nervosum</i>), Simontornya (Roewer 1951, <i>N. wiehleii</i> ; Zuordnung unsicher)" (Martens 1978: 128); listed by Van der Weele (1998a)
Dicranolasmatidae				
8	<i>Dicranolasma scabrum</i> (Herbst, 1799)	x	6/6/2/14	records from the northern border with Slovakia, Cserhát E, Mátra (Varga 1994), Bükk (e.g. Bokor in litt.), Aggtelek and S Danube, Pilis and Visegrád mountains (Loksa 1988, 1991), see Gruber (1993, 1996)

no	family/species	status	m/f/juv/ind	comment
Trogulidae				
9	<i>Trogulus</i> cf. <i>nepaeformis</i> (Scopoli, 1763)	new	4/1/-/5	the <i>T. nepaeformis</i> -group is taxonomically still unresolved; missing in the great Hungarian lowland plain?
10	<i>Trogulus</i> <i>tingiformis</i> C. L. Koch, 1848	x?/ new	-/1/2/3	records of <i>Trogulus aquaticus</i> Simon, 1879 (e.g. Kolosváry 1929: 89 & Fig. 61; Loksa 1961; Varga 1994) may concern <i>T. tingiformis</i> although Kolosváry's measurements of all mentioned <i>Trogulus</i> species seem not reliable; Weiss (1996: 277) classified <i>Trogulus aquaticus</i> as a species, which has been published from Transylvania from several localities, "die nicht gedeutet werden konnte"; missing in the list of Van der Weele (1998a); recent records from the western parts of Hungary
11	<i>Trogulus</i> cf. <i>tricarinatus</i> (Linnaeus, 1767)	x	-/1/-/1	Which of the two "forms" occur in Hungary? compare the drawings in Martens (1978: 169) and Komposch (2000a: 5 ff.) (the author did not see males)
Ischyropsalididae				
12	<i>Ischyropsalis</i> <i>hellwigi</i> <i>hellwigi</i> (Panzer, 1794)	x	2/1/-/3	another record from a cave, male and female from the rock face (40 and 150 cm respectively above the ground) between 10 and 15 metres from the entrance; see Martens (1978: 193), "Höhle bei Szakonyfalu (Loksa leg.)"
Phalangiidae				
13	<i>Astrobus</i> <i>laevipes</i> (Canestrini, 1872)	x	7/3/-/10	first record by Kolosváry (1929: 99, "Budapest, Virányos"); widespread in Hungary (e.g. Bokor 1996); in the literature frequently sub <i>Roeweriolus hungaricus</i> Kolosváry, 1933, <i>Roeweriolus Dudichi</i> Szalay, 1951 and <i>Astrobus meadi</i> (Thorell) (compare Gruber 1964); the dominant epigeic species in the litter of various oak forests (Loksa 1991)
14	<i>Egaenus</i> <i>convexus</i> (C. L. Koch, 1835)	x	7/2/-/9	widely distributed but in lowland and flood plains locally rare or missing (Martens 1978); primarily in mountainous regions above 350 m (e.g. Kolosváry 1948; Loksa 1988, 1991)
15	<i>Gyas</i> <i>titanus</i> Simon, 1879	x		one single record from Hungary by Avram (1968: 122 ff. "Tisa, rive gauche, km 738" sub <i>Gyas annulatus</i> (Olivier)); missing in the checklist of Van der Weele (1998a)
16	<i>Lacinius</i> <i>dentiger</i> (C. L. Koch, 1848)	x	-/-/5/5	missing in most faunistic papers, misidentification (<i>Lacinius ephippiatus</i>) e.g. in Kolosváry 1929; mentioned ("Sopron") and drawn by Szalay (1968: 111); three current records (Ödenburger and Mecsek Mountains) in ruderal areas and thermophilous forest edges

no	family/species	status	m/f/juv/ind	comment
17	<i>Lacinius ephippiatus</i> (C. L. Koch, 1835)	x	1/2/13/16	old data need to be revised (compare Martens 1978: 332; Van der Weele 1998b: 228); concerning misidentification see <i>Lacinius dentiger</i> (missing in Kolosváry 1929); syn.: <i>Odiellus hungaricus</i> Kolosváry, 1941 (compare Weiss 1996); several recent localities from the western and northern parts of Hungary
18	<i>Lacinius horridus</i> (Panzer, 1794)	x	-/-/21/21	widespread and constant occurrence in dry habitats; "offenbar in allen Landesteilen" (Martens 1978: 325)
19	<i>Leiobunum rotundum</i> (Latreille, 1798)	x	2/10/2/14	few records from anthropogenic influenced river banks west to the river Danube; a synonymy with <i>Liobunum soproniense</i> Szalay, 1951 seems possible
20	<i>Leiobunum rupestre</i> (Herbst, 1799)	x	9/1/-/10	poorly known distribution (e.g. Kolosváry 1965); a recent record from shaded rock faces and screes in the Geschriebenstein Nature Park near the Austrian border
21	<i>Leiobunum tisciae</i> Avram, 1968	x		"Ungarn, oberes Theiß-Tal im Mündungsgebiet des Thur zwischen Flußkilometern 715 und 744" (Avram 1968: 115 ff.; Martens 1978: 413); expansive species (Martens in litt.; Komposch 1998: 38); missing in the checklist of Van der Weele (1998a)
22	<i>Lophopilio palpinalis</i> (Herbst, 1799)	x	-/-/3/3	first record "für die Fauna Rumpfungarns" in the Kecske-cave (Bükk Mts.) in 1938 (Kolosváry 1939a: 205, 1939b); Van der Weele (1998b)
23	<i>Mitopus morio</i> (Fabricius, 1799)	x	1/-/-/1	quite similar situation to that in the Alps (e.g. Komposch 1999), quite common in mountainous regions and rather rare in the Great Hungarian Plain (Van der Weele 1998b)
24	<i>Nelima semproni</i> Szalay, 1951	x	7/11/42/90	Locus typicus, "Tacsí-Graben" SW Sopron (rem: 47°39' N, 16°32' E; ~ 420 m) (Szalay 1951: 132); etymology mysterious; common in western Hungary, missing in the east?
25	<i>Oligolophus tridens</i> (C. L. Koch, 1836)	x	-/-/16/16	abundant in moist habitats, e.g. in the Tisza flood plains (Avram 1968)
26	<i>Opilio dinaricus</i> Silhavy, 1938	x		Várpalota (rem: SW Budapest) (Rafalski 1962); underrepresented in the majority of arachnological studies (Komposch 2000b)
27	<i>Opilio parietinus</i> (De Geer, 1778)	x		"Überall" (Kolosváry 1932: 111); some published records may concern <i>O. saxatilis</i> , "Eine strenge Trennung dieser beiden Arten scheint mir nicht angebracht" (Kolosváry 1969: 80) or other species; "frequent near the houses ... also on places where the anthropogenic effect is high" (Havranek & Molnár (1965: 106); no recent record by the author!

no	family/species	status	m/f/juv/ind	comment
28	<i>Opilio saxatilis</i> C. L. Koch, 1839	x	1/1/6/8	in open grass steppes (puszta); a curious record from a stork-nest (Székessy 1944)
29	<i>Phalangium opilio</i> Linnaeus, 1761	x	11/2/7/20	"Ubiquistín" (Kolosváry 1965: 165); the heliophilous species "zieht sich jedoch bei trockener Witterung ebenfalls an feuchtere Stellen zurück" (Kolosváry 1969: 80)
30	<i>Platybunus bucephalus</i> (C. L. Koch, 1835)	x	8/6/-/14	definitively known from the mountainous north (Mátra, Bükk, Aggtelek), usually absent in the lowland
31	<i>Platybunus pallidus</i> Silhavy, 1938	?		recorded from the Zemplén Mountains (Murányi 2002); the presence in Hungary should be verified (D. Murányi in litt.)
32	<i>Rilaena triangularis</i> (Herbst, 1799)	x	9/6/-/15	inhabits various types of forests; Juveniles are similar to juvenile <i>Platybunus</i> (identification problematic)
33	<i>Zacheus crista</i> (Brulle, 1832)	x	1/-/4/5	this Ponto-Mediterranean species has the western border of its distribution in the Pilis (Loksa 1988, 1991) and Bakony Mountains,